

## Data Analysis Module 2013 Instructions April 2013

The Data Analysis Module 2013 has several improvements over the previous versions. One major improvement involves the way Ecological Status and Wetland Ratings were calculated in the Summary Worksheet. The previous version used weighted calculations on plot frequency, giving greater emphasis to the dominant plants. This increased or decreased the scoring depending on the plant species for the Winward Greenline Ecological Status, Wetland Site Rating, and the Winward Stability Rating. Weighting the dominant species provided for a larger spread in the ratings making it easier to detect changes. This module provides both the calculated average and the weighted ratings, giving the user more options for evaluating change.

Four sources of data may be transferred to the Data Analysis Module 2013.

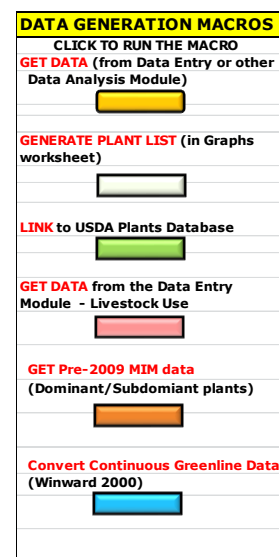
1. Data from the Data Entry Module or the Data Analysis Module for data collected from 2009 to the present.
2. Data from a post-2009 Data Entry or Data Analysis Module. A procedure is used to convert pre-2009 data, dominant and subdominant plants, to percent plant species composition along the greenline. This allows for older, pre-2009, data to be evaluated against current data.
3. Imported data from the Data Entry – Grazing Use Only module.
4. Data collected using the continuous greenline method described by Winward (2000). The module provides a method for converting these kinds of data to plots and plant composition. A procedure is provided for converting community types to percent species composition.

Data validation and correction procedures have been strengthened to improve the quality of the data being evaluated. There are four Data Correction Macros in the module.

1. The “Correct Plant Code” macro remains the same as previous versions.
2. Additional checks for possible errors have been added to the “Check for Errors” macro.
3. A new “Correct Plant Composition” procedure has been added to insure that the plant composition in each plot equals 100 or 200 depending whether just woody or herbaceous species are in the plot or if both herbaceous and woody species are present.
4. A check for woody species height in the appropriate cell has been added. The “Correct Woody Plant Heights” is a procedure to determine if only woody species are assigned plant height codes and if the code is in the correct cell.

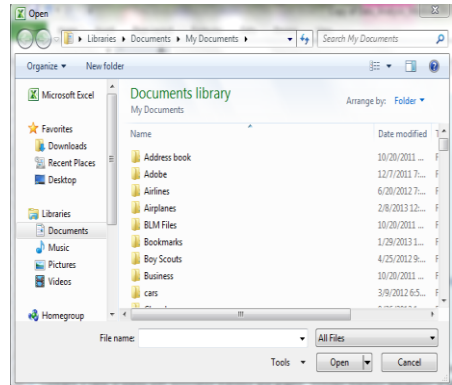
### I. Data Transfer to the Data Analysis Module 2013

- A. To post-2009 data from a Data Entry Module or from a previous Data Analysis Module versions to the Data Analysis Module 2013.
  1. Open the most current version of the Data Analysis Module (e.g., 2013).

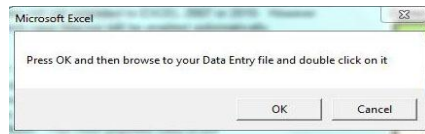


**Figure 1** – Data Generation Macros

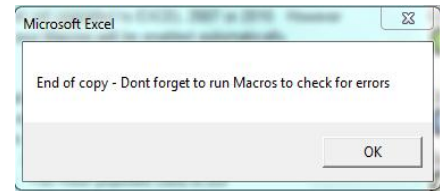
2. **Rename the Data Analysis Module to reflect the name of the DMA or stream (e.g., Silver Creek DM1).**
3. From the Instructions Spreadsheet, click the “Get Data” (from Data Entry or other Data Analysis Module) button in the DATA GENERATION MACROS box to transfer the data (see figure 1).
4. Click “OK” (see figure 2) and the browsing window will open. Select the appropriate data entry or data analysis file; double click or click “Open.”
5. When the data transfer is complete, an Excel window will appear (see figure 3); click “OK.”



**Figure 2** -- Browsing window, select the appropriate file.



**Figure 3** - Excel window after clicking "Get Data" button.



**Figure 4** - Excel window upon completion of data transfer.

- B. Data recorded on paper Field Data Sheets are entered directly into the Data Analysis Module 2013.

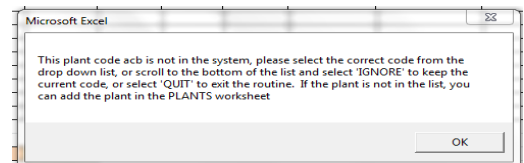
## II. Data Correction Macros. These ensure that all data is transferred and complete in the Header, DMA, Substr, Thal, and Comments spreadsheets.

- A. **Correct Plant Codes.** Click the “Correct Plant Codes” button (see figure 5) in the Data Correction Macros box on the Instructions spreadsheet. This macro compares all plants recorded in the DMA spreadsheet with the plant list in the “Plants” spreadsheet.

DATA CORRECTION MACROS	
1	<b>CORRECT PLANT CODES</b>
	<input type="button" value="Correct Plant Codes"/>
2	<b>CHECK FOR ERRORS (Red circles)</b>
	<input type="button" value="Check for Errors"/>
3	<b>CORRECT PLANT COMPOSITION</b>
	<input type="button" value="Correct Plant Composition"/>
4	<b>CORRECT WOODY PLANT HEIGHTS</b>
	<input type="button" value="Correct Woody Plant Heights"/>

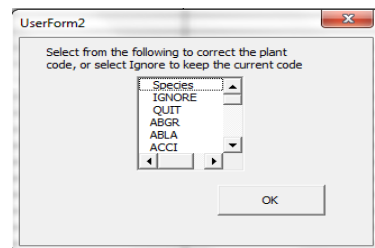
**Figure 5** - Data Corrections Macros on the Instruction Spreadsheet.

1. An Excel Window will appear (figure 6); click OK. Another window appears with three options from which to select (see figure 7).
  - a. “Ignore” leaves the plant code as is (figure 7). Select this when the plant code is correct and a new plant code will be added to the MIM database later. After new plant codes are added to the MIM database, repeat the Correct Plant Codes procedure.
  - b. “Quit” stops the Correct Plant Codes macro (see figure 7). A new plant may be added to the MIM database. Repeat the Correct Plant Code procedure.



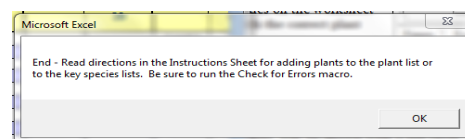
**Figure 6** - Message when a plant code in the DMA spreadsheet is not in the Plants Spreadsheet.

- c. Select the correct plant code from the dropdown list. Type the first letter of the correct plant code, the dropdown list will move to that letter in list, continue down the list to the correct code, select it and click “OK.” An Excel window will display the selected plant code (see figure 8), click “OK.” The Excel macro will replace all of the plants codes on the spreadsheet with that particular spelling with the correct plant code.



**Figure 7** - Plant codes from the Plants spreadsheet. Select the appropriate code.

- d. There are at least four species that have the same four letters in the code, sabo (*Salix bonplandiana*) and sabo2 (*Salix boothii*), and salu (*Salix lucida*) and salu2 (*Salix lutea*). If the code is sabo2 the Correct Plant Codes module will not indicate an error if sabo was entered in the DMA spreadsheet. The easiest way to correct this problem is to use the Find/Replace function in Excel. Select the white and blue rows and columns in the DMA spreadsheet, click on Find or Find/Replace, enter the invalid code “sabo” in the find field and “sabo2” in the replace field, click on “Replace All.”



**Figure 9** - Excel window which appears at the end of the “Correct Plant Codes” procedure. It reminds the user to run the “Check for Errors (red circle)” macro.

2. Continue the procedure until the procedure is completed with the Excel window shown in figure 9.

**B. Adding plant codes.** Adding plant codes to the MIM Plants database and the Key Species database in the Data Analysis Module.

1. **MIM Plants database.** Click on the PLANTS spreadsheet. Go to the bottom of the plant list and add the new plant species (figure 10).

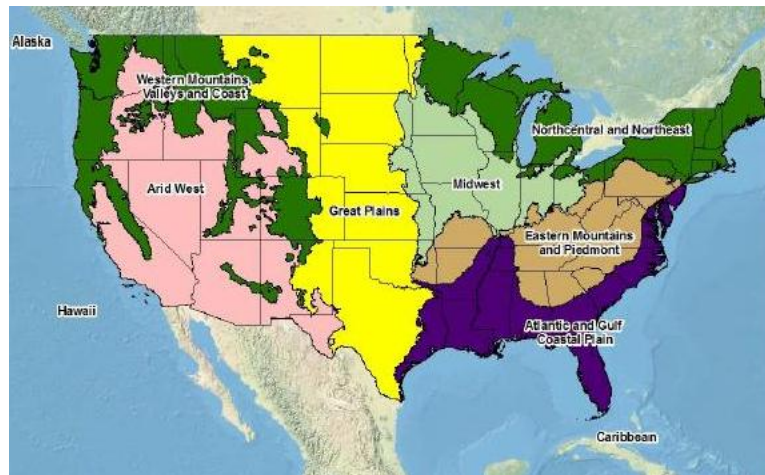
Species	Scientific - Common Name	Woody?	Hydric?	Herb?	Forb?	Wetland Rating	Successional Status	Winward stability rating
VISO	VIOLA SORORIA - Little - sand violet			y	y	50	M	2
WD	WOOD - Anchored Wood					100	L	10
XAST	ZANTHIUM STRUMARIUM - Rough cocklebur			y	y	50	E	2

**Figure 10** – Add new plants to the bottom of the plant list on the Plants spreadsheet.

- a. **Use the plant codes from the NRCS Plants Database** <http://plants.usda.gov/java/>. Enter the new plant species code, scientific – common names, if a plant is Woody (y/n), if the plant is Hydric (y/n), whether the species is Herbaceous (y/n), and if it is a Forb (y/n). The Wetland Rating is from the Wetland Indicator Status using the most current “Wetland Indicator Status” from the Army Corps of Engineers website <http://rsgisias.crrel.usace.army.mil/NWPL/>. Determine the ecological Status and the Winward Stability Rating from the literature (see *Multiple Indicator Monitoring (MIM) of Stream Channels and Streamside Vegetation*, Appendix H for the rules). Complete the information in the default (see figure 10) and the appropriate region columns (figure 11). The regions changed in the 2012 National Wetland Plant List. Descriptions and maps of the regions (see figure 12) are at <http://rsgisias.crrel.usace.army.mil/NWPL/>.

REGION: Arid West (AW)			REGION: Great Plains (GP)			REGION: Western Mountains, Valleys, & Coast (WM)		
Winward stability rating2	Successional Status2	Wetland Rating2	Winward stability rating3	Successional Status3	Wetland Rating3	Winward stability rating4	Successional Status4	Wetland Rating4
5	L	25	a	a	a	5	L	25
5	L	25	a	a	a	5	L	25

**Figure 11** – Three regions, Arid West, Great Plains, and Western Mountains, Valley, and Coast, are in MIM. The default region is the Arid West. Select the appropriate region on the “Header” spreadsheet.



**Figure 12** – U.S. Corps of Engineers 2012 Plant Wetland Indicator Status

- b. Sort the data base by selecting all the data (all columns and rows) beginning with the first plant code in the list, below Ignore and Quit. Click “Sort A to Z” in the Excel Home tab.
  2. **Key Species database.** Click on the Key Sp spreadsheet. The Stubble Height Key Species and Woody Plant Lists will appear on the spreadsheet (see figure 13).
    - a. Add new key stubble height (graminoid) species plant codes to the bottom of the Key Stubble Height Species List. This list should be resorted to facilitate the dropdown lists.
    - b. Add new key woody species codes to the bottom of the Key Woody Plant List. This list should be resorted to facilitate the dropdown lists.
- C. **Check for Errors.** This procedure checks the Header, DMA, Substr, and Thal spreadsheets for possible errors. A red circle is placed around the cell with a possible error.
  1. Click the “**Check for Errors**” button in the Data Validation box on the Instructions spreadsheet (figure 5) to run the macro. The procedure will run and return to the Instruction spreadsheet. Click on

STUBBLE HEIGHT KEY SPECIES LIST		WOODY PLANTS LIST
AGGI2		ABGR
AGST2		ABLA
ALGE2		ACCI
ALPE		ACER
ALPR3		ACGL
ARDO4		ACGR3

**Figure 13** – Key Species spreadsheet

Streambanks		Stubble Height		Width
Streambank Stability		Species	Height	GGW
E= Erosional D= Depositional	C= Covered U= Uncovered	F = Fracture, S = Slump, SL = Slough, E = Eroding, A = Absent	(Code)	(cm or inches) (meters)
		106	57	7186
a	y	ug	12.0	400.8
d	c	caa	8.0	4.0
d	c	caa	12.0	3.6
e	c	caa	8.0	4.8

**Figure 14** - Red circles around cells indicate possible errors on the Header, DMA, Substr, and Thal spreadsheets. Check each cell. Run the procedure again.

the DMA spreadsheet. Possible errors will be shown with a red circle around the cell. Some common errors are shown on the example in figure 14. The red circles are not removed by some error corrections.

- a. Incorrect codes, “a” and “y,” are shown under the “E” Erosional “D” depositional and the “C” Covered “U” uncovered columns under Streambank Stability. Correct these codes. Depositional “D” is assumed because there is no entry in the “erosional feature” column. “y” is adjacent to “u” and is assumed to be typographical error.

Plot #	Species Rock/Wood	Composition	
	(Code)	(%)	Totals Check

**Figure 15** – Pre-2009 Table on the Comments spreadsheet.

- b. Stubble Height Species column has a red circle around “ug.” “UG” is the plant code for upland grass. This code is not in the MIM Key Species plant list. Upland grass is usually not a key species on riparian areas. The code and the height may be deleted from the DMA spreadsheet or “ug” must be added to the MIM Key Species list.

Plot #	Species Rock/Wood	Composition	
	(Code)	(%)	Totals Check
1	sabo2	99	99

**Figure 16** – Pre-2009 Table with an error indicated by the red circle.

- c. The GGW column has a 400.8 meter width. All of the other measurements are between 3 and 4 meters. It is an obvious typographical error. Correct the DMA spreadsheet cell to 4.8.

- d. Check each of the cells with red circles and make the necessary corrections.

- e. Run the macro again and correct any additional errors.

2. The **Correct Plant Composition** button (see figure 5) checks the composition on the DMA spreadsheet to ensure that each plot has a total composition of 100 or 200 percent. The procedure will copy the data from the “Plant Species” and “Composition” columns in the DMA spreadsheet to the “Pre-2009 Conversion” table on the Comments spreadsheet (figure 15). A red circle will be around each cell that does not equal 100 or 200 (figure 16). Make the corrections on the DMA spreadsheet.

Plot #	Species Rock/Wood	Woody Species height class	Check for missing woody plant
43			0
			0
			0
44			0
	ELPA3	1	0
			0
45			1
			0
			0

Send data to the DMA Spreadsheet			

**Figure 17** -- Plot # 45 show a non-woody plant with a Woody Species Height Class assigned. Plot # 45 shows that a woody plant does not have a height class assigned. Click the “Send Data to the DMA Spreadsheet” button.

3. **Correct Woody Plant Heights** (see figure 5) checks for woody species in the “Species, Wood, or Rock” column and the “Woody Species Height” Column to see if there are heights assigned to non-woody species or woody species without heights. Red circles indicate a problem; correct the data on the table (see figure 17). Click the “Send Data to the DMA Spreadsheet” button (figure 17). **Pre-2009 data will have no woody species height information.**

### III. Analyzing Pre-2009 Data in the Data Analysis Module 2013.

Dominant and subdominant plant species were recorded rather than the estimated percentage of each species prior to 2009. Open a Data Analysis Module. Make a master copy of the Data Analysis Module and keep it in another location. Rename the DAM, e.g. Data Analysis Module Summerhouse Creek DMA 1.



## A. To transfer data from pre-2009 Data Entry or Data Analysis Modules

1. Click the “GET Pre-2009 MIM Data (Dominant/Subdominant plants)” button (figure 18) in the “General Macros” on the Instructions spreadsheet” to run the macro.
2. An Excel window will appear (see figure 19). Click “OK.”
3. A browsing window will open (Figure 20), select the appropriate file and double click or click “Open.” An Excel window (see figure 21) will appear when the “Get Data” macro has completed the data transfer.

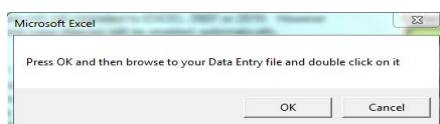


Figure 19 – Excel window that open when the “Get Pre-2009 Data” button is clicked.

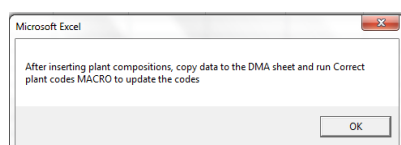


Figure 21 – This window appears when the data transfer is complete. Click “OK”.

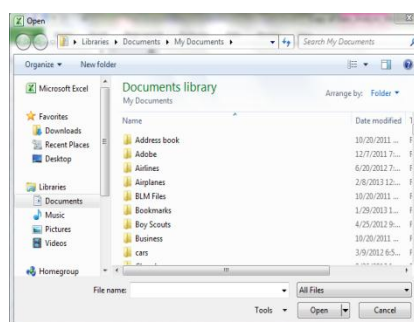


Figure 20 -- Browsing window, select the appropriate file.

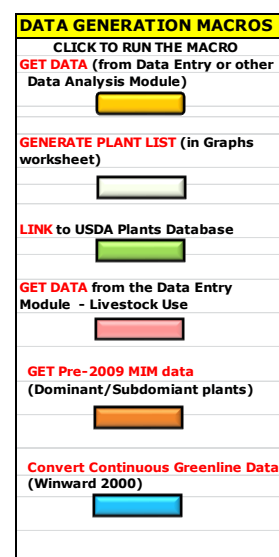


Figure 18 – Data Generation Macros

4. Check each spreadsheet, Header, DMA, Subtr, Thal, and Comments, to ensure all data was transferred. The “Plot No.” and “Greenline Composition” columns in the DMA spreadsheet will have no data. It will be added later. Also no data will be shown in the Woody Species Height column as the data was not collected before 2009. The Streambank Stability columns are blank, but the data has been transferred directly to the computation area and the results are displayed on the Data Summary spreadsheet.
5. The “Plot No.”, “Species/Rock/Wood,” and “Composition” data are found in the Pre-2009 MIM Data Table columns “Z” through “AL” on the Comments” spreadsheet (see Figure 22).
6. Assign a composition percent to each species. Dominant species are in **bold** type and subdominant not bold (see figure 23). Dominant herbaceous species total 67 and sub dominant herbaceous 33 for a total of 100. Woody species also total 100. Each plot must total 100 if only herbaceous or woody species are present and 200 if both herbaceous and woody species are in the same plot. The “Total Check” column calculates the total percentage for each plot.
7. Woody species percentages are calculated by dividing the number of woody species, dominant and sub dominant, in a plot into 100. If two woody species occur in a plot, each is recorded as

Plot #	Species Rock/Wood	Composition	
	(Code)	(%)	Totals Check
1	<b>caut</b>		0
2	sabo2		0
	<b>caut</b>		
	cane2		
3	<b>cane2</b>		0
	caut		

Figure 22 – Pre-2009 MIM Data Table on the “Comments” spreadsheet.

50. Single herbaceous species recorded in either the dominant or subdominant columns are recorded as 100. Below are some examples of combinations that commonly occur (see figure 23).

- a. **Single species, dominant or subdominant.** When as single herbaceous or woody specie plant code is in the plot. The total for the row and plot is 100 (see figure 23, Plot # 1 and 2).
- b. **Two dominant species.** When two species, either two herbaceous or two woody, in the plot, each get 50 percent (see figure 23, plot # 3 and 4).
- c. **Herbaceous plant species in dominant and subdominant columns.** Herbaceous species occur as both the dominant and the subdominant, record 67 for the dominant plant and 33 for the subdominant plant (see figure 23, plot # 5).
- d. **One dominant herbaceous and two subdominant herbaceous plants, rock and/or wood.** One dominant species and two subdominant species are recorded at 67 for the dominant and 17 and 16 for subdominant (see figure 23 plot # 6).
- e. **One woody and one herbaceous species, rock, and/or wood.** One woody specie and herbaceous specie are recorded as 100 and 100. The total for the plot is 200 (see figure 23 plot # 7).
- f. **Multiple herbaceous species, rock, and/or wood.** Plot # 8 on figure 23 shows one dominant herbaceous species recorded as 67 and three subdominant recorded as 11, 11, and 11 for a total of 33.
- g. **Two woody species.** Two woody species are recorded as 50 and 50 for 100 (see figure 23, plot # 9).
- h. **Two woody species and three herbaceous species.** Two woody species are recorded as 50 and 50 and two dominant herbaceous and one subdominant species are recorded as 42, 42 and 16 for a total of 200 (figure 23, plot # 10).
- i. **One woody plant recorded as subdominant.** Record the woody specie as 100 (figure 23, plot # 11).
- j. **One woody and two herbaceous species in the dominant column.** Record the woody species as 100 and each of the herbaceous species as 50 and 50.
- k. **Three woody and 4 herbaceous species, rock and/or wood.** Three woody species are given 34, 33, and 33. Two dominant and two subdominant species, rock, and/or wood are given 34, 34, 16, and 16 (figure 23, plot # 12).

Plot #	Species Rock/Wood (Code)	Composition (%)	Totals Check
1	cane2	100	100
2	potr5	100	100
3	roar3	50	100
	tory	50	
4	popr	50	100
	cane2	50	
5	popr	67	100
	cane2	33	
6	cane2	67	100
	popr	17	
	agst2	16	
7	roar3	100	200
	popr	100	
8	popr	67	100
	agst2	11	
	cane2	11	
	rk	11	
9	roar3	50	100
	potr5	50	
10	sabo2	50	200
	sage2	50	
	caut	42	
	cane2	42	
	popr	16	
11	sabo2	100	
12	sage2	34	
	alin2	33	200
	cose15	33	
	popr	34	
	agst2	16	
	cane2	16	
	caut	34	

**Figure 23** – Examples of percentages assigned to dominant and sub dominant species. The total for each plot is calculated in the “Total Check” column as percentages are added to each plot.

8. Review the “Totals Check” column to ensure that each plot is either 100 or 200.

9. Click the “Send Data to the DMA Spreadsheet” button (see figure 24).
10. Return to “**II. Data Correction Macros.**” Complete all of the data corrections procedures.

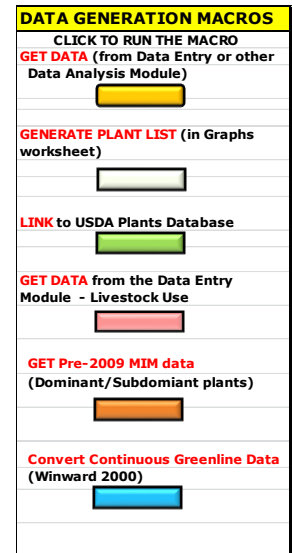
Totals Check	Send data to the DMA Spreadsheet			

**Figure 24** – Send data to the DMA Spreadsheet.

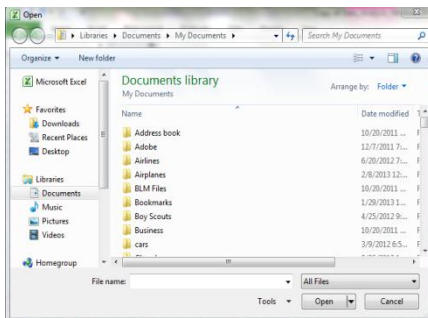
#### IV. **Get Data** from the Data Entry Module – Grazing Use Only

The “Data Entry Module – Grazing Use Only” is designed for convenience on the field computers running Excel Mobile. It has only Streambank Alteration, Stubble Height, Woody Use, and Streambank Stability in the module. All of the columns are in view without having to scroll across the screen.

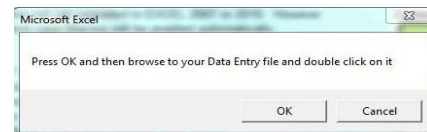
- A. Click the “**Get Data** from the Data Entry Module – Grazing Use ONLY” button on Data Generation Macros (see figure 25).
- B. An Excel window (figure 26) will appear, click “OK” and a browsing window appears (figure 27).
- C. Select the appropriate Data Entry Module – Grazing Use Only file, click “OK” or double click on the file.
- D. After the data is transferred to the Data Analysis Module window (figure 28) will appear, click “OK.”
- E. Run “Correct Plant Code” and “Check for Errors” macros (see Section II).



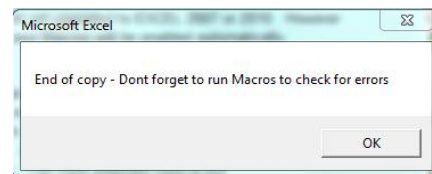
**Figure 25** – Data Generation Macros



**Figure 27** -- Browsing window, select the appropriate file.



**Figure 26** - Excel window after clicking "Get Data" button.



**Figure 28** - Excel window upon completion of data transfer.

#### V. **Convert Continuous Greenline Data (Winward 2000).** This procedure converts continuous greenline data to plots and percent composition allowing for comparison with other data.

- A. Open a copy of the Data Analysis Module 2013. **Rename the file to identify the DMA, e.g., Clear Creek DMA 1.**



**B.** The Continuous Greenline Data Conversion begins on column “CO” and column “DM” of the Comments spreadsheet.

**C.** Enter the unit of measure recorded by the observer, “S” steps (default), “F” feet, or “M” meters (see figure 29).

<b>STEPS = S (default)</b>	
<b>METERS = M</b>	
<b>FEET = F</b>	
<b>ENTER DISTANCE TYPE HERE:</b>	
<b>F</b>	

**Figure 29 --** Unit of measure along the greenline.

**D.** Enter the length of the steps if known (see figure 30). The default is 0.7 meters per step.

<b>0.7</b>	meters per step
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**Figure 30 --** Indicate the step length of the observer, if known. The default is 0.7 meter.

**F.** Enter the data into the Distance and Community Type columns in the table (see figure 32). If the data is in digital format, the data may be copied and pasted into the table.

**G.** The macro will display plot numbers and community types along the greenline at regular intervals in the colored columns of the Plot Conversion table (see figure 33). Community types with very small distances may not be shown.

You can vary the number of plots desired in the survey, up to a maximum of 150 plots	
<b>NUMBER OF PLOTS:</b>	<b>80</b>

**Figure 31 --** Setting the number of plots along the greenline.

**H.** Use the following rules to convert vegetation community types to percent species composition in the “Species, Rock, or Wood” column (column DB on the Comments spreadsheet).

1. A single species, herbaceous or woody, is recorded in the as 100 (see figure 33, plot #s 1 and 2).
2. One woody and one herbaceous species are recorded as 100 each for a total of 200 (see figure 33, plot # 3).
3. Two woody species in the community type is recorded as 50 each for a total of 100 (see figure 33, plot # 4).
4. When two herbaceous species are present, the first listed species is recorded as 67 and the second species is 33 for a total of 100 (see figure 33, plot # 5).
5. Two woody species and one herbaceous species are recorded as 50 for each of the woody species and 100 for the herbaceous species for a total of 200 (see figure 33, plot # 6).
6. Three woody species in the community type would be recorded as 34, 33, and 33 for a total of 100 (see figure 33, plot # 7).
7. When three herbaceous species are in the community type, the first listed is given 50, the second 33, and the third 17 for a total of 100 (see figure 33, plot # 8).

Feet Distance	Community Type	Distance (m) 0
704	juba	214.5792
347	caa	320.3448
1	phar	320.6496
117	casi	356.3112
32	carex	366.0648
6	cane	367.8936
226	caut	436.7784
18	sadr/pop	442.2648
2	alin2	442.8744
27	eleoc	451.104
2	saex	451.7136
2	salu/pop	452.3232
24	glst	459.6384
12	eqar	463.296
732	popr	686.4096

**Figure 32 --** Data Entry Table for continuous greenline data.

8. When rock or wood is recorded in the community type, it uses the same rules as the herbaceous plant species (see figure 33, plot # 9).
- I. After completing recording the species composition, click the “Send data to the DMA Spreadsheet” button (see figure 34). The “Plot #, species/rock/wood, and composition,” data will be transferred to the Data Analysis Module.
- J. Return to section “II, Data Correction Macros” and follow the instructions.

Plot	Distance	Community	Plot #	Species Rock/Wood	Composition
		Type		(Code)	(%)
1	8.6	juba	1	juba	100
2	368.9	sage2	2	sage2	100
3	437.6	sadr/poppr	3	sadr	100
				poppr	100
4	321.2	sadr/sabo2	4	sadr	50
5	125.1	cane2/poppr	5	cane2	67
				poppr	33
6	321.2	sage2/sabo2/caut	6	sage2	50
				sabo2	50
				caut	100
7	27.0	sage2/sabo2/ribes	7	sage2	34
				sabo2	33
				ribes	33
8	10.2	cane2/agst2/poppr	8	cane2	50
				agst2	33
				poppr	17
9	30.0	rk/wd/poppr	9	rk	50
				wd	33
				poppr	17

**Figure 33 --** Determine and record the "Composition" for each species listed in the community type.

	Send data to the DMA Spreadsheet			
Composition				
(%)				

**Figure 34 --** Send data to the DMA spreadsheet.